

## **Attachment 2**

### **TAN V-Tanks Design Specifications (SPC-555 Abridged)**



**TO VIEW ATTACHMENT 2 SEE DOCUMENT NUMBER:  
SPC-555, REV.00 – CONSTRUCTION SPECIFICATION  
FOR TSF-09 AND TSF-18 REMEDIATION**

**Attachment 3**

**Project Calculations and Analyses**



This attachment contains the following EDFs, they are available on EDMS:

EDF-4602	“TSF-09/18 V-Tank Contents Removal and Site Remediation”
EDF-4604	“Shielding and Exposure Calculations for V-Tank Waste Process Activities”
EDF-4672	“TSF-09/18 V-Tank Contents Removal and Site Remediation”
EDF-4751	“V-Tanks Contents Remediation Mechanical Design”
EDF-4885	“Reevaluation of Characteristic Toxicity Designation for V-Tank Waste, Using Existing Sample Data”
EDF-4928	“Potential Feed Streams for Inclusion in V-Tank Treatment Process”
EDF-4956	“Design for VOC Control for the TSF-09/18 V-Tank Remedial Action”
EDF-5017	“Secondary Containments and Support Skid Design for V-Tanks Consolidation Tanks”
EDF-5196	“Supporting Calculations for APAD 04-53 TAN V-Tanks Remediation TSF-09/18”
EDF-5595	“TSF-09/18 V-Tanks Remediation Lifting Design”
EDF-5727	“Corrosion Evaluation for Stainless Steel V-Tanks”
EDF-5734	“TSF-09/18 V-Tanks Remediation Transport Tie-Down Analysis”
EDF-5786	“Subsidence Evaluation for V-1, V-2, V-3, and V-4 in the ICDF Cell”
EDF-5905	“Evaluation of Necessity of Off-Gas Scrubber for V-Tanks Treatment Process”
EDF-6099	TSF-09/18 V-Tanks Remediation Crane Verification
EDF-6259	TSF-09/18 V-Tanks Remediation Pump Seal Evaluation
EDF-6306	V-9 Tank Macroencapsulation and Lifting Design
EDF-6326	Revised Source Term Inventory for the V-Tank Waste
EDF-6327	Evaluating Air-Safety for the Col-Located Worker During Controlled Air Sparging of Consolidated TAN V-Tank Waste, Without Activated Carbon Adsorption
EDF-6332	APAD Support Calculations for Revised Source Term for TAN-V-Tanks Remediation
EDF-6364	V-Tank Off-gas Data Evaluation and Remaining Inventory Determination
EDF-6376	V-Tank Air Stripping Calculations and Process Sizing



## **Attachment 4**

### **Air Permitting Applicability Determination (APAD 04-53)**





## AIR PERMITTING APPLICABILITY DETERMINATION

**Note:** This completed form serves as official transmittal and documentation of the Environmental Affairs (EA) Air Permitting Applicability Determination (APAD) and is approved based on the information and project description supplied by a Project Manager or Designee. This form is the official means of documenting APAD review, and specifies project specific permitting actions required and/or operating conditions for the emission of air pollutants, or 40 CFR 68 requirements for storage of regulated chemicals. Unless operation or construction is initiated within one year (or as otherwise noted in the APAD), the APAD is valid for one year from the Issuance Date. If project operation or construction is not initiated within one year of the Issuance Date, or the Project Manager or Designee fails to provide project status or a revision request to EA, the APAD will be rescinded. Project status is made using INEEL Form 450.31. The calculations used herein are performed in accordance with approved environmental protocols, and therefore may not suffice for use in health, safety, or radiological control evaluations.

### Section A. Document Concurrence

**Instructions:** The APAD Document Preparer shall sign the appropriate block and obtain the signature of the APAD Technical Reviewer and the Project Manager. Additional signatures may be obtained at the request of cognizant EA, facility, or project personnel.

Project Title: TAN V-Tanks

APAD Issuance Date: \_\_\_\_\_

NEPA Document or Project Number: \_\_\_\_\_

APAD Tracking Number: 04-53

#### APAD Document Preparer:

I have prepared this document in accordance with applicable requirements and regulatory agency guidance, and I verify it is true, accurate, and complete to the best of my knowledge.

J. W. Gill

Print/Type Name

J. W. Gill

Signature

9-9-04

Date

#### APAD Technical Reviewer (Must complete APAD Appendix B Checklist):

I have reviewed this document for technical accuracy and content, including the validation of calculations where applicable, and concur that it is true, accurate, and complete to the best of my knowledge.

N. Stanley

Print/Type Name

N. Stanley

Signature

9/9/04

Date

#### Project Manager (Must complete APAD Appendix C Checklist):

I concur that based on my inquiry of the person(s) who prepared this document, and/or the person(s) directly responsible for gathering or providing the information, the document is true, accurate, and complete to the best of my knowledge.

J. J. Jessmore

Print/Type Name

J. J. Jessmore

Signature

9/9/04

Date

Title: \_\_\_\_\_

I concur that based on my inquiry of the person(s) who prepared this document, and/or the person(s) directly responsible for gathering or providing the information, the document is true, accurate, and complete to the best of my knowledge.

Print/Type Name

Signature

Date

Title: \_\_\_\_\_

I concur that based on my inquiry of the person(s) who prepared this document, and/or the person(s) directly responsible for gathering or providing the information, the document is true, accurate, and complete to the best of my knowledge.

Print/Type Name

Signature

Date

Title: \_\_\_\_\_

I concur that based on my inquiry of the person(s) who prepared this document, and/or the person(s) directly responsible for gathering or providing the information, the document is true, accurate, and complete to the best of my knowledge.

Print/Type Name

Signature

Date

Title: \_\_\_\_\_

I concur that based on my inquiry of the person(s) who prepared this document, and/or the person(s) directly responsible for gathering or providing the information, the document is true, accurate, and complete to the best of my knowledge.

Print/Type Name

Signature

Date

## AIR PERMITTING APPLICABILITY DETERMINATION

### Section B. Common APAD Acronyms

AEI	Air Emissions Inventory	APAD	Air Permitting Applicability Determination
ARAR	Applicable or Relevant and Appropriate Requirements	BRC	Below Regulatory Concern
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	EA	Environmental Affairs
EC	Environmental Checklist	EPA	United States Environmental Protection Agency
IDAPA	Idaho Administrative Procedures Act	IDEQ	Idaho Department of Environmental Quality
NEPA	National Environmental Policy Act	NESHAP	National Emissions Standard for Hazardous Air Pollutants
PSD	Prevention of Significant Deterioration	PTC	Permit To Construct
RMP	Risk Management Plan	TAP	Toxic Air Pollutant
WAG	Waste Area Group		

### Section C. Air Permitting Applicability Determination

*Instructions: Indicate determination by checking the appropriate box. The appropriate "No Permitting Required" box must be checked for any "Category I" or "Category II Exemption." A Below Regulatory Concern (BRC), Level 1, 2, or 3 determination must also be checked for any Category I or II Exemption for which Toxic Air Pollutants (TAPs) are documented.*

- |   |  |
|---|--|
| <input type="checkbox"/> Permit to Construct (PTC) Required from Regulatory Agency  | <input type="checkbox"/> PTC Modification Required from Regulatory Agency  |
| Category I Exemption:<br>TAPs: <input type="checkbox"/> BRC; <input type="checkbox"/> Level 1; <input type="checkbox"/> Level 2; <input type="checkbox"/> Level 3 | Category II Exemption:<br>TAPs: <input type="checkbox"/> BRC; <input type="checkbox"/> Level 1; <input type="checkbox"/> Level 2; <input type="checkbox"/> Level 3 |
| <input type="checkbox"/> Risk Management Plan Required  | <input type="checkbox"/> NESHAP Approval to Construct Required   |
| <input type="checkbox"/> Further Evaluation for Permitting Required   | <input type="checkbox"/> No Permitting Required, Without Conditions  |
| <input type="checkbox"/> No Permitting Required, With Conditions (See Sections E, F, & G)   |  |
| <input checked="" type="checkbox"/> No Permitting Required, CERCLA Action with Conditions (Must Meet ARARs, See Sections E, F, & G)                               |  |

### Section D. Brief Description of Air Pollutant Emitting Aspects of Proposed Activity

*Instructions: Include in this section a brief description that summarizes the scope of the project, the facility affected, whether the facility currently has emissions, and a summary of emission impacts caused by the proposed project. Information such as a paraphrased summary of the project description in an Environmental Checklist (EC), location, vents, and horsepower ratings for engines, should be included. Documents (including relevant letters, relevant e-mails, written records of personal communications, etc.) upon which this description is based must be included in the APAD information file. Date and identify the source of information for all material placed in this APAD and the APAD information file.*

The V-tanks have about 12,000 gallons of waste. This waste will be sparged for a minimum of 48 hours and then chemically oxidized. The oxidized waste will be stored until sufficient quantity is available for grouting. After analytical results confirm that the waste meets LDR and Idaho CERCLA waste acceptance criteria the waste will be shipped to ICDF for disposal. This APAD makes the conservative assumption that all of the emissions will come from one stack (although multiple stacks may be used) in the time frames as described in Section J.

The chemical oxidation treatment process consists of a 600 gallon reaction vessel followed by a demister and condenser. The demister and condenser are an integral part of the treatment process in that they were designed to reflux any volatilized organic compounds back into the reaction vessel to enhance more complete oxidation. Although the liquids in the reaction vessel are maintained at boiling temperatures, the gas exiting the treatment process (i.e. the condenser) is maintained at less than boiling conditions. As such radionuclide emissions will be estimated using the 0.1% emission factor from 40 CFR 61 Appendix D for non-boiling systems. The gases leaving the treatment process are controlled via an off-gas system consisting of a scrubber, granular activated carbon, and HEPA filter.

This APAD 04-53 supercedes the V-tank emissions covered in APAD 03-10.

### Section E. Impacts and Summary of Applicable Regulations

*Instructions: Based upon review of applicable project information, regulations, agency guidance, and EA regulatory clarification documents, check all boxes for which the project may incur regulatory impact or requirement.*

- |   |  |
|---|--|
| <input type="checkbox"/> Change in Stack Parameters | <input checked="" type="checkbox"/> CERCLA Remedial Action |
| <input type="checkbox"/> Excess Emissions Reporting | <input type="checkbox"/> Demolition Notification           |

## AIR PERMITTING APPLICABILITY DETERMINATION

- |  |  |
|--|--|
| <input type="checkbox"/> Fuel Sulfur Content                               | <input type="checkbox"/> Fuel Burning Equipment Particulate Matter     |
| <input type="checkbox"/> Fugitive Dust Control                             | <input type="checkbox"/> NESHAP Asbestos Notification                  |
| <input type="checkbox"/> Air Emissions Inventory                           | <input type="checkbox"/> NESHAP Continuously Monitored Radionuclide    |
| <input checked="" type="checkbox"/> NESHAP Radionuclide Actual Emissions   | <input type="checkbox"/> Title V Operating Permit                      |
| <input checked="" type="checkbox"/> NESHAP Unabated Radionuclide Emissions | <input type="checkbox"/> Notification of Emissions Change              |
| <input type="checkbox"/> Open Burning                                      | <input type="checkbox"/> Particulate Matter Process Weight Limitations |
| <input type="checkbox"/> Portable Equipment Registration                   | <input type="checkbox"/> Subcontractor Internal Combustion Engine(s)   |
| <input type="checkbox"/> Subcontractor Permitting/Registration             | <input checked="" type="checkbox"/> Visible Emissions                  |
| <input type="checkbox"/> Risk Management Plan                              | <input type="checkbox"/> None  |

### Section F. Summary of Requirements of Operations

*Instructions: For each impact checked in Section E, cite the regulation and summarize the applicable requirements.*

NESHAP Radionuclide Actual Emissions - All radiological emissions to the environment, including those from all point and diffuse sources, must be determined for demonstrating compliance with the NESHAP Standard [see CFR 61.93 (a)] and submitted for reporting in the INEEL NESHAP's Annual Report per 40 CFR 61.94. If any fugitive radiological emissions are released, the performing organization Project Manager or Source Owner/Manager shall ensure that the calendar year emissions are determined and reported (via signed memorandum).

NESHAP Unabated Radionuclide Emissions - The unabated radiological emissions to the environment which must be calculated for each affected stack or vent, must be calculated/measured annually per 40 CFR 61.93.(b)(4)(i) (periodic confirmatory measurement). The Source Owner/Manager shall ensure that the calendar year emissions are determined and reported (via signed memorandum).

Visible Emissions: IDAPA 58.01.01.625 - A person shall not discharge any air pollutant into the atmosphere from any point of emission for a period or periods aggregating more than three (3) minutes in any sixty (60) minute period which is greater than twenty percent (20%) opacity as determined by this section. (4-5-00). If visible emissions are observed from internal combustion equipment used for this project, or visible emissions are observed from other actions related to the project, the performing organization Project Manager shall ensure the visible emissions are in compliance with IDAPA 58.01.01.625.

CERCLA Remedial Action - Remedial action must meet the substantive requirements of the Clean Air Act (CAA) which are considered either Applicable or Relevant and Appropriate (ARAR), and may include State of Idaho and Federal requirements. The performing organization Project Manager shall ensure CERCLA project personnel calculate projected emissions from the CERCLA remediation and maintain documentation in the CERCLA project file. Control of pollutant emissions may be negotiated with EPA subject to public review and comment. CERCLA actions involving radionuclide emissions must be reported in the NESHAP annual report.

### Section G. Facility/Project Tasks for Demonstration of Compliance to Requirements

*Instructions: For each requirement presented in Section F, specify in Part II below detailed actions that Facility/Project personnel must take to adequately demonstrate compliance. This includes identifying required reports/notifications (including due dates), documenting the manner in which throughput limitations are to be met, identifying required monitoring methods and frequency, specifying record keeping frequency, and providing details on any specific tasks necessary to document actual or potential emissions. State "No Compliance Tasks" for any requirement in Section F for which Facility/Project personnel have no responsibilities.*

Part I: Facility/Project task responsibilities applicable to all projects:

- A The Facility Manager or Designee shall ensure this APAD is maintained with its associated information file at an on-site location (See Appendix C for facility identified storage location)
- B The Facility Manager or Designee, using the INEEL Form 450.31, shall provide to EA Policy and Permitting, an annual notification of project status, and one-time notification within 30 days after any of the following:
  - 1. Construction---NA
  - 2. Startup ---NA
  - 3. Completion --NA
  - 4. Cancellation
- C The Project Manager or Designee shall provide advance written notification to EA Policy and Permitting as soon as possible if the project scope changes. Notification to EA is necessary to ensure the APAD is accurate and complete for a proposed scope change.

Part II: Facility/Project task responsibilities specific to this project:

## AIR PERMITTING APPLICABILITY DETERMINATION

- A. Emissions Limitations—This evaluation was based on several factors and assumptions, which were considered part of the physical and operational design of this source. The emissions are assumed to represent the maximum operating scenario. Any changes to the assumptions listed in Appendix A should be evaluated to determine whether this evaluation remains valid.
- B. NESHAP Radionuclide Actual Emissions -- Report annual radiological emission to Environmental Affairs by February 28 for the preceding year for inclusion in the INEEL NESHAP Annual Report for Radionuclides.
- C. NESHAP Unabated Radionuclide Emissions -- The unabated radiological emission to the environment which must be calculated for each affected stack must be calculated annually per 40 CFR 61.93(b)(4)(i) (periodic confirmatory measurement). The source owner shall ensure that the calendar year emissions are determined and reported to EA by February 28 for the preceding year.
- D. CERCLA Remedial Action -- Remedial action must meet the substantive requirements of the CAA which are considered either Applicable or Relevant and Appropriate Requirements, and may include State of Idaho and Federal requirements. Emission calculations should be maintained in the appropriate project file.
- E. Visible Emissions -- Do not discharge any air pollutant into the atmosphere from any point of emission for a period or periods aggregating more than three minutes in any sixty minute period which is greater than twenty percent opacity as determined by this section (IDAPA 58.01.01.625).

### Section H. Summary of Applicable Environmental Reports Performed by Environmental Affairs

*Instructions: Based on the presence of regulated air pollutants documented in this APAD and the applicability of regulatory requirements, check the appropriate boxes below to indicate those reports and documents prepared by EA that are impacted by this APAD.*

- |   |  |
|---|--|
| <input type="checkbox"/> Air Emissions Inventory                  | <input type="checkbox"/> Title V Air Operating Permit            |
| <input type="checkbox"/> Annual Toxics Report                     | <input type="checkbox"/> NESHAP Continuous Compliance Monitoring |
| <input checked="" type="checkbox"/> NESHAP Annual Report          | <input type="checkbox"/> NESHAP Periodic Confirmatory Monitoring |
| <input type="checkbox"/> PSD Quarterly Report                     | <input type="checkbox"/> Risk Management Plan                    |
| <input type="checkbox"/> Semi-Annual Continuous Compliance Report | <input type="checkbox"/> None                                    |

### Section I: Justification for APAD

*Instructions: Cite the regulation upon which the determination is based, and document how the project meets each condition of the regulation. Background documentation, including emission calculations and modeling, which substantiates the determination, must be included in Appendix A.*

#### STATE REGULATIONS

This project will be conducted under CERCLA. The project is not required to meet administrative requirements (permitting, notifications, etc). However, the following evaluation was performed to document that the potential uncontrolled emissions of criteria air pollutants would be less than the significant emission rates in IDAPA 58.01.01.6.92. Therefore, the project emissions would not be subject to the substantive requirements associated with a detailed permitting analysis, such as a Prevention of Significant Deterioration (PSD) review, increment consumption analysis, application of Best Available Control Technology (BACT), etc.

IDAPA 58.01.01.203 No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:

1. Emission Standards. The stationary source or modification would comply with all applicable local, state or federal emission standards.

Qualification: The source will comply with all substantive local, state and federal emission standards

2. NAAQS. The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard.

Qualification: The source will be located in an attainment area; therefore emissions could not significantly contribute to a violation where no violation of an ambient air quality standard has occurred. The projected ambient concentrations will not cause a violation of an ambient air quality standard.

3. Toxic Air Pollutants. Using the methods provided in Section 2310, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.

## AIR PERMITTING APPLICABILITY DETERMINATION

Qualification: The projected emissions and ambient concentrations of toxic air pollutants will comply with IDAPA 58.01.01.585 and 586 standards.

### FEDERAL REGULATIONS

This project will be conducted under CERCLA. The project is not required to meet administrative requirements (permitting, notifications, etc). The following federal regulations were reviewed for applicability to this project.

40 CFR Part 61 Subpart H, National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities, was determined to be applicable to the project due to the radionuclide emissions.

- 40 CFR 61.96 – Applications to construct or modify. An application for approval to construct is required for activities involving new construction of or modification within an existing facility when the effective dose equivalent, caused by all emissions from the new construction or modification equals or exceeds 1 % of the standard prescribed in 40 CFR 61.929i.e., emissions greater than or equal to 0.1 mrem/yr). Potential emissions are calculated using Appendix D to 40 CFR 61 which outlines release and effluent control factors.

Qualification: As demonstrated in Appendix A the potential effective dose equivalent (EDE) from this source is below 1 % of the standard, i.e., less than 0.1 mrem/yr.

40 CFR 61.93 Emission monitoring and test procedures. In order to determine whether a release point is subject to the emissions measurement requirements of 40 CFR 61.93(b), continuous monitoring, it is necessary to evaluate the potential for radionuclide emission for the release point. In evaluating the potential of a release point to discharge radionuclides into the air for purposes of continuous monitoring, the estimated radionuclide release rates shall be based on the discharge of the effluent stream that would result if all pollution control equipment did not exist, but the facilities operations were otherwise normal. Sources with unabated potential emissions determined to equal or exceed 0.1 mrem/yr are required to be continuously monitored.

Qualification: As demonstrated in Appendix A the potential unabated radiological emissions EDE from this source for purposes of continuous monitoring applicability were calculated at 0.0105mrem/yr, which is below the 0.1 mrem/yr standard. The requirement for continuous monitoring is not applicable to the operation of this source.

## AIR PERMITTING APPLICABILITY DETERMINATION

### Section J: Toxic Air Pollutant Emission Information

*Instructions: Upon identifying the presence of applicable toxic air pollutants for the project, the APAD Document Preparer shall identify the specific pollutants and document their emission rates. Refer to IDAPA 58.01.01.585 and 586 to complete this section. If no TAPs are expected to be present, state "None" or "N/A".*

Potential TAP emissions from this source are less than the applicable emissions levels or are less than the acceptable ambient concentrations for all non-carcinogens and carcinogens per IDAPA 58.01.01.585 and 586.

**Assumptions:**

- Total emissions were provided by operations.
- Modeling analysis is attached.
- Each non-carcinogenic pollutants total emissions were divided by 48 to obtain a lb/hr/48 hr quantity.
- Each carcinogenic pollutants total emissions were divided by 8760 to obtain a lb/hr/annual quantity
- Modeling analysis was done to determine the non-carcinogenic 24 hour release to ambient concentration factor of 0.0082 mg/m3 for a one lb release.

Example for AL (1.28 lb/hr)(0.0082 mg/m3/lb/hr) = 0.010496 mg/m3.

- Modeling analysis was done to determine the carcinogenic annual release to ambient concentration factor of 0.0071 ug/m3 for a one lb release.

Example for Arsenic (0.00000602 lb/hr)(0.0071 ug/m3/lb/hr) = 0.00000042742 ug/m3.

TAN V-TANKS NON-CARCINOGENS					
POLLUTANT	EMISSIONS lb/hr/48 hr	IDAPA EL lb/hr	EMISSIONS mg/m3	IDAPA AAC mg/m3	LESS THAN IDAPA EL OR AAC
Al	1.28E+00	6.67E-01	1.05E-02	5.00E-01	Y
Cr	8.11E-01	3.30E-02	6.65E-03	2.50E-02	Y
Fe	7.63E+00	3.30E-02	6.26E-02	2.50E-01	Y
Mg	4.29E+00	6.67E-01	3.52E-02	5.00E-01	Y
Mn	1.99E+00	3.30E-01	1.63E-02	2.50E-01	Y
Si	3.25E+01	6.67E-01	2.67E-01	5.00E-01	Y
Sb	3.29E-03	3.30E-02	2.70E-05	2.50E-02	Y
Ba	5.20E-02	3.30E-02	4.26E-04	2.50E-02	Y
Hg	2.04E-01	3.00E-03	1.67E-03	2.50E-03	Y
Se	1.04E-03	1.30E-02	8.53E-06	1.00E-02	Y
Ag	5.07E-02	7.00E-03	4.16E-04	5.00E-03	Y
Zn	5.39E-01	6.67E-01	4.42E-03	5.00E-01	Y
Co	1.19E-03	3.30E-03	9.76E-06	2.50E-03	Y
Cu	5.10E-02	1.30E-02	4.18E-04	1.00E-02	Y
Sn	4.85E-03	1.33E-01	3.98E-05	1.00E-01	Y
Fluoride	2.08E-02	1.67E-01	1.71E-04	1.25E-01	Y
TCA, methyl chloroform	2.66E-01	1.27E+02	2.18E-03	9.55E+01	Y
Acetone	1.96E-01	1.19E+02	1.61E-03	8.90E+01	Y
Carbon disulfide	1.69E-02	2.00E+00	1.39E-04	1.50E+00	Y
Trans-1,2-dichloroethylene	1.29E-02	5.27E+01	1.06E-04	3.95E+01	Y
2-butanone	1.04E-01	3.93E+01	8.53E-04	2.95E+01	Y
1,2-dichloropropane	3.49E-02	2.31E+01	2.86E-04	1.74E+01	Y
Bromoform	6.95E-02	3.33E-01	5.70E-04	2.50E-01	Y

# AIR PERMITTING APPLICABILITY DETERMINATION

2-hexanone	6.95E-02	1.33E+00	5.70E-04	1.00E+00	Y
Toluene	3.51E-02	2.50E+01	2.88E-04	1.88E+01	Y
Chlorobenzene	1.69E-02	2.33E+01	1.39E-04	1.75E+01	Y
Ethylbenzene	1.69E-02	2.90E+01	1.39E-04	2.18E+01	Y
Styrene	3.48E-02	6.67E+00	2.85E-04	1.00E+00	Y
Cis-1,2-dichloroethylene	1.58E-02	5.27E+01	1.30E-04	3.95E+01	Y
Xylene	1.70E-02	2.90E+01	1.39E-04	2.18E+01	Y
Naphthalene	2.76E-02	3.33E+00	2.26E-04	2.50E+00	Y
1,2,4-trichlorobenzene	2.89E-02	2.47E+00	2.37E-04	1.85E+00	Y
1,4-dichlorobenzene	3.01E-02	3.00E+01	2.47E-04	2.25E+01	Y
Phenol	2.99E-02	1.27E+00	2.45E-04	9.50E-01	Y
2,4,5-trichlorophenol	1.56E-01	—	1.28E-03	1.60E-03	Y
2-chlorophenol	3.24E-02	3.30E-02	2.66E-04	2.50E-02	Y
2-nitroaniline	1.56E-01	2.00E-01	1.28E-03	1.50E-01	Y
3-nitroaniline	1.56E-01	2.00E-01	1.28E-03	1.50E-01	Y
4-nitroaniline	1.56E-01	2.00E-01	1.28E-03	1.50E-01	Y
di-n-octylphthalate	3.24E-02	3.33E-01	2.66E-04	2.50E-01	Y
Diethylphthalate	3.24E-02	3.33E-01	2.66E-04	2.50E-01	Y
Dimethylphthalate	3.24E-02	3.33E-01	2.66E-04	2.50E-01	Y
Hexachlorocyclopentadiene	3.24E-02	7.00E-03	2.66E-04	5.00E-03	Y
Isophorone	3.24E-02	1.87E+00	2.66E-04	1.40E+00	Y
Nitrobenzene	3.24E-02	3.33E-01	2.66E-04	2.50E-01	Y
Pentachlorophenol	1.56E-01	3.30E-02	1.28E-03	2.50E-02	Y
pyridine	3.24E-02	1.00E+00	2.66E-04	7.50E-01	Y
di-n-butylphthalate	2.90E-02	3.33E-01	2.38E-04	2.50E-01	Y

## TAN V-TANKS CARCINOGENS

POLLUTANT	EMISSIONS lb/hr/Annual	IDAPA EL lb/hr	EMISSIONS ug/m3	IDAPA AACC ug/m3	LESS THAN IDAPA EL OR AACC
Arsenic	6.02E-06	1.50E-06	4.27E-08	2.30E-04	Y
Berillium	1.64E-05	2.80E-05	1.16E-07	4.20E-03	Y
Cadmium	3.30E-05	3.70E-06	2.34E-07	5.60E-04	Y
Nickel	2.41E-04	2.70E-05	1.71E-06	4.20E-03	Y
vinyl chloride	9.29E-05	9.40E-04	6.60E-07	1.40E-01	Y
methylene chloride	2.01E-04	1.60E-03	1.43E-06	2.40E-01	Y
1,1-dichloroethane	3.97E-05	2.50E-04	2.82E-07	3.80E-02	Y
chloroform	9.26E-05	2.80E-04	6.57E-07	4.30E-02	Y
1,2-dichloroethane	1.92E-04	2.50E-04	1.36E-06	3.80E-02	Y
carbon tetrachloride	9.27E-05	4.40E-04	6.58E-07	6.70E-02	Y
1,1,2-trichloroethane	9.26E-05	4.20E-04	6.57E-07	6.20E-02	Y
benzene	1.91E-04	8.00E-04	1.36E-06	1.20E-01	Y
bis(2-ethylhexyl)phthalate	6.07E-03	2.80E-02	4.31E-05	4.20E+00	Y
benzo(a)pyrene	1.77E-04	2.00E-06	1.26E-06	3.00E-04	Y



# AIR PERMITTING APPLICABILITY DETERMINATION

hexachlorobenzene	1.77E-04	1.30E-05	1.26E-06	2.00E-03	Y
hexachlorobutadiene	1.77E-04	3.30E-04	1.26E-06	5.00E-02	Y
hexachloroethane	1.77E-04	1.70E-03	1.26E-06	2.50E-01	Y
bis(2-chloroethyl)ether	1.77E-04	2.00E-05	1.26E-06	3.00E-03	Y
Aroclor-1254	2.86E-07	6.60E-05	2.03E-09	1.00E-02	Y
Aroclor-1260	2.43E-04	6.60E-05	1.73E-06	1.00E-02	Y
TCE, Trichloroethylene	8.88E-03	5.10E-04	6.30E-05	7.70E-01	Y
PCE, tetrachloroethene	2.04E-03	1.30E-01	1.45E-05	2.10E+00	Y
1,1,2,2-tetrachloroethane	9.27E-05	1.10E-05	6.58E-07	1.70E-02	Y
1,1-dichloroethylene	9.39E-05	1.30E-04	6.67E-07	2.00E-02	Y
2,4,6-trichlorophenol	1.77E-04	1.20E-03	1.26E-06	1.80E-01	Y

## AIR PERMITTING APPLICABILITY DETERMINATION

### Appendix A. Project Emissions

*Instructions: Include sample calculations and a summary of emissions results. (Modeling results must be attached for any modeling that has been conducted.) Reference all assumptions and documentation upon which the calculations are based, including relevant documents, letters, e-mails, written records of personnel communication, and all variables in calculations. Include the formula view (if available) or provide example equations for any electronic worksheets calculating emission values.*

#### ASSUMPTIONS:

- Modeling analysis was done using the EPA CAP 88 modeling to determine the unit Ci Dose for each of the radionuclides. The maximally exposed individual near the INEEL site boundary was determined to be 12100 m NE of TAN. A copy of the modeling is attached.
- Release factor of 0.001(emissions from water) was used for particulate radionuclides and a release factor of 1 was used for the gaseous (H3).
- Potential Annual Dose for each radionuclide is determined by multiplying the potential emissions by the radionuclide unit Ci dose factor.

Example: Am-241,  $(0.0000654 \text{ Ci}) / (5.74 \text{ mrem/yr/ci}) = 0.000375396 \text{ mrem/yr}$

TAN V-TANKS RADIONUCLIDES					
Radionuclide	Total Curies	Emission Factor	Potential Emissions Curies	Unit Ci Dose mrem/yr/Ci	Potential Annual Dose mrem/yr
Pu-239/240	5.23E-02	1.00E-03	5.23E-05	3.74E+00	1.96E-04
Am-241	6.54E-02	1.00E-03	6.54E-05	5.74E+00	3.75E-04
Cm-242	2.69E-04	1.00E-03	2.69E-07	1.86E-01	5.00E-08
Cm-243/244	1.68E-02	1.00E-03	1.68E-05	3.85E+00	6.47E-05
Np-237	2.24E-04	1.00E-03	2.24E-07	5.24E+00	1.17E-06
U-233/234	3.98E-02	1.00E-03	3.98E-05	1.42E+00	5.65E-05
U-235	1.28E-03	1.00E-03	1.28E-06	1.33E+00	1.70E-06
U-238	8.51E-04	1.00E-03	8.51E-07	1.25E+00	1.06E-06
Sr-90	1.08E+02	1.00E-03	1.08E-01	4.77E-02	5.15E-03
Ag-110m	1.20E-02	1.00E-03	1.20E-05	1.41E-02	1.69E-07
Ce-144	8.45E-02	1.00E-03	8.45E-05	5.57E-03	4.71E-07
Co-58	1.22E-02	1.00E-03	1.22E-05	1.68E-03	2.05E-08
Co-60	2.99E+00	1.00E-03	2.99E-03	6.91E-02	2.07E-04
Cs-134	3.58E-02	1.00E-03	3.58E-05	3.79E-02	1.36E-06
Cs-137	5.42E+01	1.00E-03	5.42E-02	7.29E-02	3.95E-03
Eu-152	1.40E-01	1.00E-03	1.40E-04	6.63E-02	9.28E-06
Eu-154	2.31E-01	1.00E-03	2.31E-04	5.34E-02	1.23E-05
Eu-155	2.48E-02	1.00E-03	2.48E-05	2.35E-03	5.83E-08
Mn-54	4.40E-03	1.00E-03	4.40E-06	4.40E-03	1.94E-08
Nb-95	2.61E-02	1.00E-03	2.61E-05	1.59E-03	4.15E-08
Ra-226	1.86E-02	1.00E-03	1.86E-05	2.12E-01	3.94E-06
Ru-103	1.06E-01	1.00E-03	1.06E-04	5.76E-04	6.11E-08
Ru-106	8.83E-02	1.00E-03	8.83E-05	8.45E-03	7.46E-07
Sb-125	3.56E-02	1.00E-03	3.56E-05	7.24E-03	2.58E-07
Zn-65	1.12E-02	1.00E-03	1.12E-05	1.35E-02	1.51E-07

## AIR PERMITTING APPLICABILITY DETERMINATION

Zr-95	2.53E-02	1.00E-03	2.53E-05	1.20E-03	3.04E-08
I-129	4.66E-04	1.00E-03	4.66E-07	2.75E-01	1.28E-07
Ni-63	7.06E+00	1.00E-03	7.06E-03	1.40E-04	9.88E-07
H3	1.27E+00	1.00E+00	1.27E+00	1.39E-05	1.77E-05
Ag-108m	8.28E-03	1.00E-03	8.28E-06	6.69E-01	5.54E-06
K-40	2.10E-06	1.00E-03	2.10E-09	5.46E-02	1.15E-10
Th-228	2.72E-07	1.00E-03	2.72E-10	2.53E+00	6.88E-10
Th-230	3.19E-07	1.00E-03	3.19E-10	2.53E+00	8.07E-10
Pu-238	1.20E-01	1.00E-03	1.20E-04	3.46E+00	4.15E-04
Total Dose mrem/yr					1.05E-02

### POTENTIAL V-TANK EMISSIONS COMPARED TO IDAPA 58.01.01.6.92 SIGNIFICANT EMISSION RATES

POLLUTANT	EMISSIONS lb/hr	EMISSIONS ton/yr	SIGNIFICANCE LIMIT ton/yr	< SIGNIFICANCE LIMIT
Lead	5.04E-4	2.21E-3	6.0E-1	Yes
Beryllium	1.64E-5	7.19E-5	4.0E-4	Yes
Mercury	1.12E-3	4.9E-3	1.0E-1	Yes

# AIR PERMITTING APPLICABILITY DETERMINATION

## Appendix B. APAD Technical Reviewer Quality Checklist

Instructions: This checklist is provided to assist in the Quality Review of the APAD form. For each question enter the review date in the applicable box.

Quality Review Questions	Yes	No	N/A	Date
1. Have sections C through J been completed?	✓			
2. Does Section D provide an adequate description of the project, and is it substantiated by the information in the draft or final EC, Appendix A, and/or the project information file?	✓			
3. Have the applicable boxes in Section E been marked appropriately based on the scope of the project presented in the draft or final EC, Appendix A, and/or the project information file?	✓			
3a. Have applicable requirements been listed for impacts checked in Section E?	✓			
4. Has a detailed task/responsibility been prescribed for Facility/Project personnel in Section G for each requirement presented in Section F?	✓			
4a. Does each task provide sufficient detail to direct facility/project personnel in maintaining, demonstrating, and documenting compliance?	✓			
5. Have all the applicable boxes for reports been checked in Section H based on the presence/absence of potential air pollutant emissions or 40 CFR 68 regulated chemicals identified in Section D, Appendix A, the draft or final EC, and/or the project information file?	✓			
5a. Has the Annual Toxics Report been accurately marked if toxic air pollutants are present?			✓	
5b. Has the NESHAPs Annual Report been accurately marked if radiological emissions are present?	✓			
5c. Has the AEI been accurately marked if this is a new source, an existing source, or an inactivation of an existing source?			✓	
6. Is the justification in Section I accurate and consistent with EA Policy, and substantiated by the information in the APAD Appendix A?	✓			
6a. If the APAD indicates this is a pre-existing source where no increase in emissions are expected or no construction or modification impacting existing source parameters are expected, has it been adequately documented?			✓	
7. Has Section J identified applicable Toxic Air Pollutants likely to be emitted based on the scope of work described by Section D?	✓			
8. Has sufficient information been provided by the facility/project and included in Appendix A and/or the project information file to make an accurate permitting determination?	✓		✓	
8a. Are the emission calculations accurate, reasonable, and defensible?	✓			
8b. Have all equations been clearly shown including all variables and sources of variables, and have adequate assumptions been provided?	✓			
8c. Have appropriate modeling results been included or referenced?	✓			
8d. If modeled as a ground release, has emission source applicability for ground release modeling been verified?			✓	
8e. If applicable, has a quality statement been signed and submitted by the modeler confirming that modeling was performed in accordance with the INEEL Air Modeling Protocol INEEL/INT-98-00236?			✓	
9. If questions 1 through 8 have been marked "Yes" or "N/A" has a consistency check been completed by the EA Policy and Permitting Manager or Designee?	✓			

Reviewer Comments:

Instructions: Insert reviewer comments if necessary.

# 8 - NA. permitting is an administrative requirement that is NA for this CERCLA project.

Independent Technical Review Performed By:

N. Stanley  
Print/Type Name

  
Signature

9/9/04  
Date

## AIR PERMITTING APPLICABILITY DETERMINATION

### Appendix C. Project/Facility Manager Requirements Quality Checklists

Instructions: These checklists are provided to assist in the quality review of the APAD requirements. For each numbered question enter the review date in the applicable box. The Project Manager and Facility Manager are required to complete their respective checklists prior to issuance of a complete APAD.

#### Project Manager

Requirements and Quality Review Questions	Yes	No	N/A	Date
1. Is the information in this APAD accurate and complete to the best of your knowledge?	<input checked="" type="checkbox"/>			
2. Does the information in Section D and the APAD Information File provide an accurate description of the project and its anticipated scope?	<input checked="" type="checkbox"/>			
3. Can the project satisfy all the requirements specified in Section G, and provide all the specified information?	<input checked="" type="checkbox"/>			
4. Do you acknowledge the requirement to provide notice of project status within the time period specified in the APAD in order to prevent cancellation of the APAD authorization?	<input checked="" type="checkbox"/>			
5. Do you acknowledge the need to request an APAD revision from EA should the project scope, potential emissions, and/or actual emissions change from what was previously presented in Section D, Appendix A, and/or the APAD Information File?	<input checked="" type="checkbox"/>			

Who is responsible for providing notice to EA for the annual project status update and the one-time project construction, operation, completion, and cancellation notices?

DAVID EATON

Who is responsible for providing written notice to EA of any changes to the scope of the project as currently documented in Section D and the APAD information file?

DAVID EATON

In which on-site record storage facility will a copy of this APAD be maintained?

TAD DOCUMENT CONTROL CENTER

Who is the current records coordinator for the on-site record storage facility?

MARCIA MAIS

#### Project Manager:

Signature indicates that the reviewer has completed the checklist, verifies that the information is true, accurate, and complete, and accepts responsibility for ensuring that the final signed copy is sent to the designated records storage facility.

J. J. Jessmore  
Print/Type Name

Signature

Date

9/9/04

#### Facility Manager

Requirements and Quality Review Questions	Yes	No	N/A	Date
1. Do you recognize and acknowledge that the tasks presented in Section G are the responsibility of the performing organization/facility and are required in order to demonstrate compliance?	<input checked="" type="checkbox"/>			
2. Can the facility satisfy all the requirements specified in Section G, and provide all the specified information? Requirements can be satisfied by several means (e.g. equipment operating logs, procedures, assessments, engineering design files, monthly or annual reports).	<input checked="" type="checkbox"/>			
3. Do you concur with the records storage location and coordinator designated above?	<input checked="" type="checkbox"/>			

#### Facility Manager:

Signature indicates that the reviewer has completed the checklist and verifies that the information is true, accurate, and complete.

AL MILLHOUSE  
Print/Type Name

Signature

Date

9/9/04

# **AIR MODELING ANALYSIS FOR THE V-9 TANK PROJECT AT TAN**

**Revision 2**

**Chris Staley  
BBWI Applied Geosciences  
September 14, 2004**

## **INTRODUCTION**

This report presents modeling results for both radiological and non-radiological releases from the V-9 Tank Project at TAN. Unit Ci releases of radionuclides were modeled with the CAP-88 code to a maximally exposed receptor at the INEEL boundary. A 1 lb/hr release of a generic non-radiological contaminant was modeled with the ISC code, for both 24-hr and annual average concentrations, to receptors at the nearest highway and the INEEL boundary, respectively. This revision to Revision 1 of the report dated August 30 added tritium (H-3) to the radionuclide list.

## **METHODS AND ASSUMPTIONS**

The CAP88 code (EPA, 1990) was used to model one Ci releases of radionuclides from the project. Doses were modeled at the maximum INEEL boundary location (12 km NNE of TAN), using 10-year (1987-96) average meteorology from the 10-m level of NOAA's LOFT met tower.

Air dispersion modeling for non-radiological releases was performed with the ISC-PRIME model, using the Lakes Environmental interface, Version 4.8. Regulatory default options were selected. The release point was assumed to be at ground-level. Even though the stack is 20 feet high, it is not 2.5 times higher than the nearby project enclosure tent. For ease of future scaling of concentrations to releases, a 1 lb/hr (0.126 g/s) release rate was assumed. Three years (1996-98) of meteorological data from the 10-m level of NOAA's LOFT met tower were used for dispersion modeling. Two meteorological files were prepared: for modeling annual average concentrations, an 800-m lid height is assumed; for 24-hour average concentrations, a 100-meter lid height is assumed (Staley and Abbott, 1998). Annual average concentrations were calculated on a uniform Cartesian grid, with grid points at 1000 meter spacing. Annual average concentrations were also calculated on discrete Cartesian coordinates placed at 1000 m intervals along the INEEL boundary, east, north, and west of TAN. 24-hour average concentrations were calculated on a uniform Cartesian grid with grid points at 100 meter spacing. 24-hour average concentrations were also calculated on discrete Cartesian coordinates placed at 100 m intervals along Highway 33, south of TAN (nearest ambient air location).

## RESULTS

Table 1 shows unit Ci doses to the maximally exposed individual at the INEEL boundary. These unit doses can be used to calculate actual doses once releases of radionuclides from the project are known. An Excel spreadsheet for these calculations is provided separately.

Concentration contours plotted by ISC-PRIME for annual average and 24-hour average concentrations are shown in Figures 1 and 2, respectively. The maximum annual average concentration at the INEEL boundary was  $7.1\text{E-}03 \mu\text{g}/\text{m}^3$ . The maximum 24-hour average concentration on Hwy 33 was  $8.2 \mu\text{g}/\text{m}^3$ . These concentrations are both based on a 1 lb/hr (0.126 g/s) release rate, so actual concentrations of non-radiological releases from the V tank project will need to be scaled to actual releases rates.

## REFERENCES

- EPA (U.S. Environmental Protection Agency), 1990, The Clean Air Act Assessment Package - 1988 (CAP-88), A Dose and Risk Assessment Methodology for Radionuclide Emissions to Air, Volumes 1-3, prepared by D. A. Beres, SC&A, Inc., for the U.S. Environmental Protection Agency.
- Staley, C. S. and M. L. Abbott, 1998, *INEEL Air Modeling Protocol*, INEEL/INT-98-00236, Rev. 0, July 1998.

Table 1. Unit Ci dose by nuclide to MEI for TAN ground-level release.

Nuclide	Unit Ci Dose (mrem/yr/Ci)
AG-108M	6.69E-01
AG-110M	1.41E-02
AM-241	5.74E+00
CE-144	5.57E-03
CM-242	1.86E-01
CM-243	3.85E+00
CM-244	3.03E+00
CO-58	1.68E-03
CO-60	6.91E-02
CS-134	3.79E-02
CS-137/BA-137M <sup>b</sup>	7.29E-02
EU-152	6.63E-02
EU-154	5.34E-02
EU-155	2.35E-03
H-3	1.39E-05
I-129	2.75E-01
K-40	5.46E-02
MN-54	4.40E-03
NB-95	1.59E-03
NI-63	1.40E-04
NP-237	5.24E+00
PU-238	3.46E+00
PU-239	3.74E+00
PU-240	3.73E+00
RA-226	2.12E-01
RU-103	5.76E-04
RU-106/RH-106	8.45E-03
SB-125/TE-125M	7.24E-03
SR-90/Y-90	4.77E-02
TH-228	2.53E+00
TH-230	2.53E+00
U-233	1.42E+00
U-234	1.41E+00
U-235	1.33E+00
U-238	1.25E+00
ZN-65	1.35E-02
ZR-95	1.20E-03

a. As calculated by CAP88 to MEI at INEEL Boundary, 12 km NNE; 10-yr average met from TAN Met tower

b. For parent daughter pairs, dose is combined parent/daughter dose





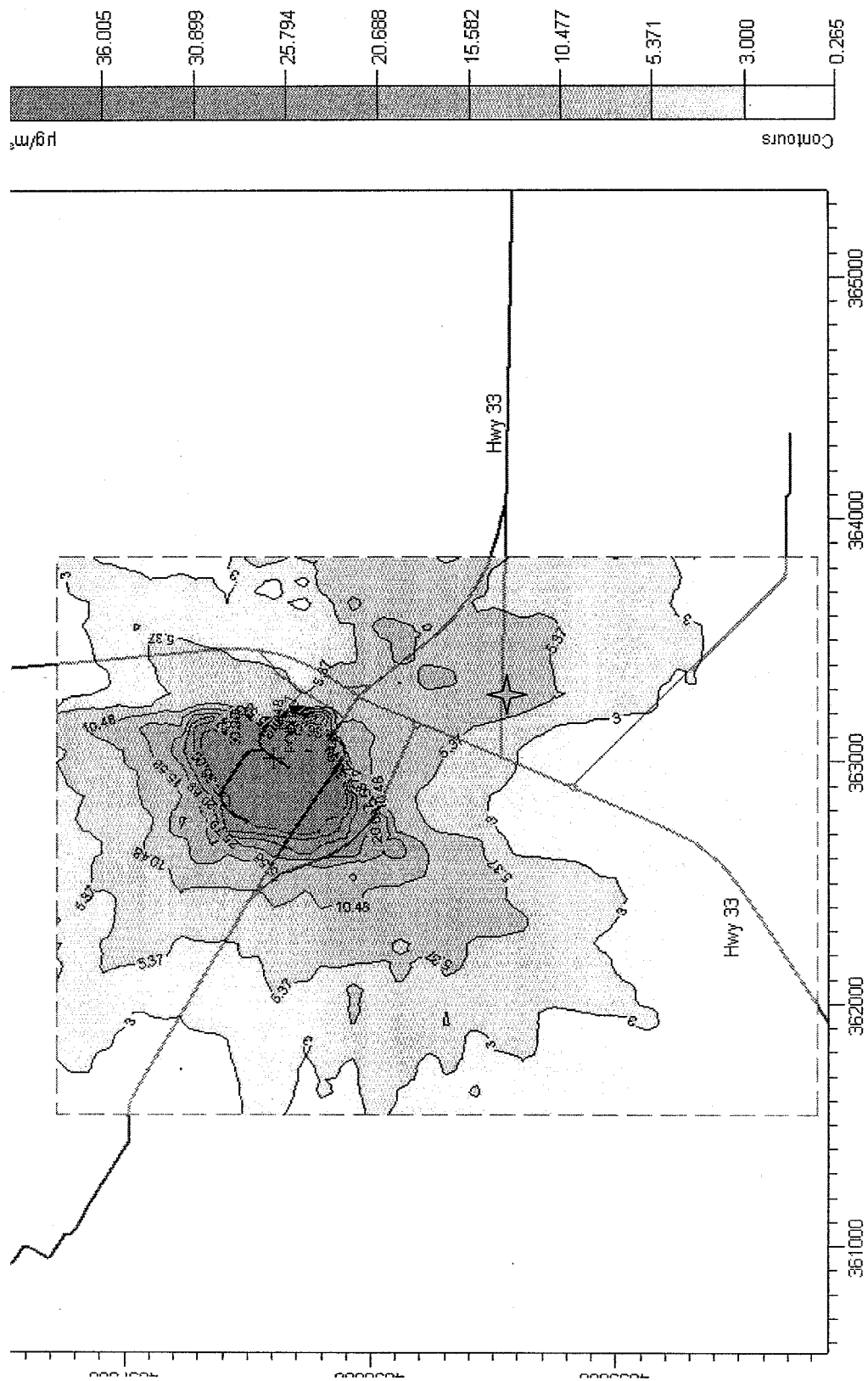


Figure 2. TAN V Tank Project – 24-hour average concentration contours ( $\mu\text{g}/\text{m}^3$ ), based on 1 lb/hr release. Yellow cross is approximate location of maximum ambient air concentration.